AF/2154

IN THE UNITED STATES PATENT AND TRADEMARK OFFICE
Before the Board of Patent Appeals and Interferences

Applicant:	Yvon Legallais et al.
Ser. No.:	09/980,354
Filed:	November 29, 2001
For:	METHOD AND DEVICE FOR ESTABLISHING A ROUTING TABLE IN A COMMUNICATION NETWORK
Examiner:	Ashokkumar B. Patel
Art Unit:	2154

APPEAL BRIEF

May It Please The Honorable Board:

This is Appellants' Brief on Appeal from the final rejection of claims 1 – 14. Please charge any fee or credit overpayment for filing this Brief to Deposit Account No. 07-0832. Enclosed is a single copy of the Brief and a Petition for Extension of Time extending the deadline for filing the Brief by four months to expire on April 11, 2006. Appellants waive an Oral Hearing for this appeal.

I. REAL PARTY IN INTEREST

The real party in interest of Application Serial No. 09/980,354 is the Assignee of record:

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Signature Lori Kleuren Date: April 10, 2006

France

II. RELATED APPEALS AND INTERFERENCES

There are currently, and have been, no related Appeals or Interferences regarding Application Serial No. 09/980,354 known to the undersigned attorney.

III. STATUS OF THE CLAIMS

Claims 1-14 are rejected and the rejection of claims 1 - 14 are appealed.

IV. STATUS OF AMENDMENTS

All amendments were entered and are reflected in the claims included in Appendix I.

V. SUMMARY OF CLAIMED SUBJECT MATTER

Independent claim 1 claims a method for determining a routing table in a communication network comprising buses connected by bridges, each bridge comprising two companion portals, a first portal being connected to a first bus and a second portal being connected to a second bus, each bus being identified by a unique bus identifier, each portal being identified by a unique portal identifier (page 1, lines 28-34; figs. 2-6, page 5, line 34 - page 6, line 8), said method comprising the steps of: (a) transmitting, by a given portal, routing table data stored by said given portal to a companion portal associated with said given portal and receiving, by said given portal, routing table data from the companion portal (page 2, lines 1-3; page 9, lines 13-14); (b) concatenating said routing table data received in step (a) with the contents of the routing table data stored by said given portal (page 2, lines 4-5; page 9, lines 15-18); (c) broadcasting said routing table data stored by said given portal on a local bus associated with the given portal (page 2, lines 6-10; page 9, lines 15-17); (d) receiving routing table data broadcast by other portals on the local bus and concatenating said received routing table data broadcast by other portals with contents of

the routing table data stored by said given portal (page 2, lines 6-10; page 9, lines 15-17); (e) repeating the above steps until routing data concerning all buses in the network has been received by said given portal (page 2, lines 11-12; page 9, lines 13-18).

Independent claim 14 claims a portal device (P202, P203) adapted to be connected to a first communication bus (B201, B202) and adapted to be linked to a companion portal device (P202, P203) for connection to a second communication bus (B201, B202), the portal device comprising: a bus interface (101) for connection to said first communication bus; a switching fabric interface (102) for connection to said companion portal device; a memory (104) for storing routing table data; means for transmitting (105, 106, 107 and page 5, lines 20-26) routing table data stored in said memory to said companion portal, for broadcasting (PHY, LINK and page 5, lines 15-16) routing table data stored in said memory on said first communication bus, for controlling (103 and page 5, lines 30-32) said bus interface and switching fabric interface to receive or transmit routing table data, and for concatenating (104 and page 5, lines 30-32) received routing table data with data stored in said memory during successive receive and transmit cycles relating to routing table data for remote communication buses.

VI. GROUNDS OF REJECTION TO BE REVIEWED ON APPEAL

The Examiner has rejected claims 1-4, 7-10 and 12-14 under 35 USC 102(b) as being anticipated by Tai, T., Gerla, M., "LAN Interconnection; A Transparent, Short-Path Approach" IEEE International Conference on Communications, 23-26, June 1991, pages 1666-1670, vol. 3 ("Tai").

The examiner has rejected claims 5 and 6 under 35 USC 103(a) as being unpatentable over Tai and further in view of Garcia (US Published Application 20020049561)

The examiner has rejected claim 11 under 35 USC 103(a) as being unpatentable over Tai and further in view of Oechsle (US Pat. No. 5570466)

VII. ARGUMENT

Rejection of claims 1-4, 7-10 and 12-14 under 35 USC 102(b) as being anticipated by Tai, T., Gerla, M., "LAN interconnection; a transparent, short-path approach" IEEE International Conference on Communications, 23-26, June 1991, pages 1666-1670, vol. 3.

"A claim is anticipated only if each and every element as set forth in the claim is found, either expressly or inherently described, in a single prior art reference." *Verdegaal Bros. v. Union Oil Co. of California*, 814 F.2d 628, 631, 2 USPQ2d 1051, 1053 (Fed. Cir. 1987). See MPEP 2131.

Tai fails to disclose or suggest all of the limitations of Claims 1 and 11 and hence fails to anticipate claims 1 and 11, and the claims that depend therefrom, as a matter of law.

Claim 1

Independent claim 1 recites:

1. Method for determining a routing table in a communication network comprising buses connected by bridges, each bridge comprising two companion portals, a first portal being connected to a first bus and a second portal being connected to a second bus, each bus being identified by a unique bus identifier, each portal being identified by a unique portal identifier, said method comprising the steps of:

(a) transmitting, by a given portal, routing table data stored by said given portal to a companion portal associated with said given portal and receiving, by said given portal, routing table data from the companion portal;

(b) concatenating said routing table data received in step (a) with the contents of the routing table data stored by said given portal;

(c) broadcasting said routing table data stored by said given portal on a local bus associated with the given portal;

(d) receiving routing table data broadcast by other portals on the local bus and concatenating said received routing table data broadcast by other portals with contents of the routing table data stored by said given portal;

(e) repeating the above steps until routing data concerning all buses in the network has been received by said given portal.

Accordingly, claim 1 broadly encompasses a method for building a routing table by performing an iterative process that includes exchanging routing table data between two companion portals of a bridge, concatenating received routing table data with the routing table data of a given portal, exchanging the routing table data between portals connected to the same bus, concatenating the received routing table data with routing table data of the given portal, and repeating these steps until the routing data for all of the buses in the network have been received.

The Tai reference is directed to an entirely different problem within a different context and fails to disclose or suggest each of the limitations recited in claim 1. In particular, the present invention is directed to the problem of determining a routing table in a network of buses that are interconnected by bridges, each of the bridges comprising two companion portals connected to respective buses. By contrast, Tai is directed to a new intelligent MAC layer device called a brouter that allows all links in a network to be effectively utilized and shortest paths to be used. The brouter ID must be unique within the network and each port is uniquely identified within a brouter.

The nature of determining a routing table in a context of a network of buses is quite different in from building routing tables in a context of a Local Area Network (LAN). For example, a bus is identified by its own address, whereas a LAN has no specific address because each element of the LAN has its own MAC address. In a bus the address for routing is shared by all nodes connected to the bus and the identifier of all nodes is updated at the reset of the bus. Whenever a new node appears or disappears on a bus, there is a bus reset. Thus, in the environment of the invention, an update of routing tables is useful only when a bus reset occurs. On a LAN, the problem is quite different because the routing tables are continuously updated. Tai mentions this point in the last paragraph of section 2.1 ("The construction of the forwarding database is essentially a background process in a brouter")

In addition, the structure of a LAN and a bus network of the present invention are very different. In the context of the invention, bridges interconnect buses and routing tables contain bus addresses. In other words, bridges connecting the buses store and update routing tables containing the address of the element (bus) to which they are connected. In a LAN, routing tables contain node addresses, the nodes belonging to a LAN interconnected by the routers. In other words, routers in a LAN do not store or update routing tables containing address of the element (LAN node) to which they are not directly connected. Rather, there is a LAN infrastructure between LAN nodes and LAN routers. Thus, the physical link between a bridge and the buses according to the invention is very different from the physical link between a LAN router and LAN nodes.

In view of the differences above and the description of the process in Tai, it is clear that Tai fails to disclose or suggest the limitations or claim 1. The method of Tai for building a routing table involves the steps of building a delay table at each brouter, exchanging these delay tables between the brouters, and computing a routing table at each port based on the delay tables. Tai also addresses the different problem of determining a

unique LAN ID for each LAN, and building a mapping table between all station IDs and their LAN ID. This process is completely different from the method of the present invention, which involves exchanging routing tables between portals of a bridge and concatenating the exchanged routing tables in an iterative process to generate the routing tables.

The specific steps for determining the routing table is described in paragraph 2.2, which states in part, "more specifically, at brouter b, say, the tables $Delay_b(i)$ and $OutPort_b(i)$ are kept ..." and gives the algorithm to compute these tables: $Delay_b(i) = min_{b'}\{Delay_{b'}(i) + l(b, b')\}$. After computing the tables, each brouter b hosts its own $Delay_b(i)$ table. Then, an exchange of the Delay table occurs between brouters, e.g., "... the forwarding database at each port is constructed by exchanging the delay tables periodically ..." Once these delay tables have been received, the forwarding database is computed using the specified algorithm, e.g., "[a]fter receiving the delay tables, each port p, say, of brouter b calculates its own forwarding database indexed by destination LAN id as follows ..."

Tai fails to disclose or suggest the limitation of "... transmitting by a given portal, routing table data stored by said given portal to a companion portal associated with said given portal and receiving, by said given portal, routing table data from the companion portal." This limitation relates to an exchange of routing table data at the level of each bridge, particularly, **between the different routing tables located at companion portals of a particular bridge**.

Page 1667 of Tai is cited as disclosing this limitation. However, the portion of Tai cited by the Examiner relates to an algorithm to build a mapping table and a scheme to broadcast a list of local stations on a LAN (obtained by intersecting the lists of station ids on all the ports which are directly connected to that LAN (inter-bridge)). This portion does not disclose or suggest the feature of exchanging routing tables between portals of a bridge.

Furthermore, applied to the context of Tai, this limitation of claim 1 would require an exchange in a brouter **between routing tables maintained at the port level of the brouter**. However, Tai says nothing regarding the exchange of data within a particular brouter, instead, Tai teaches the exchange of data **between ports of different brouters** on a connected LAN.

Tai also fails to disclose or suggest the limitation of "... concatenating said routing table data received in step (a) with the contents of the routing table data stored by said given portal." This limitation relates to the combining of routing table data in a given portal. Nowhere does Tai disclose or suggest the feature of combining routing table data by ***concatenation*** in a given portal.

The portion of Tai cited by the examiner as disclosing this feature, namely Column 1, page 1669, in fact concerns the problem of building a mapping table between station id and LAN id, not routing table data, and is not at all concerned with building of a routing table. This problem does not arise in the context of the present invention where the network addresses are the concatenation of the bus ID and the GUID of the destination on the bus. The cited paragraph actually teaches ***intersecting*** lists to obtain a list of stations IDs on all ports that are directly connected to that LAN. Intersecting lists to obtain a list of station IDs is entirely different from concatenating routing table data, and Tai simply does not mention or suggest the concatenation of table data as recited in claim 1.

Tai also fails to disclose or suggest the limitation "... (c) broadcasting said its own routing table data on the portal's local bus associated with the given portal... " The examiner cites page 1668, col. 2, and page 1668, col. 1, as disclosing the feature recited in step (c). Applicants submit that the cited portion fails to disclose or suggest this feature. Actually, page 1668, col. 2 discusses an algorithm to determine a LAN id, not a method to

build a routing table, and page 1668, col. 1 concerns the delay table used before the step of computing the routing table. The cited portions are not related to routing table data.

Tai also fails to disclose or suggest the limitation "... (d) receiving routing table data broadcast by other portals on the local bus and concatenating said received routing table data broadcast by other portals with contents of the routing table data stored by said given portal." The examiner cites page 1668, col. 1 as disclosing this step. Applicants respectfully disagree that the cited portions disclose the recited limitation. First of all, the shortest path is not added to routing database, the delay table is used to compute the routing database. Tai does not appear to describe any operation that could be seen as a **concatenation** of routing table data. According to the invention, the use of term concatenation makes clear that the received routing table data are just added to the table (see for example, page 9, lines 14-16 and lines 25-26).

Finally, Tai fails to disclose or suggest the limitation "... repeating the above steps by said given portal until routing data concerning all buses in the network has been received by said given portal." This limitation refers to the fact that steps (a), (b), (c) and (d) are executed iteratively until the routing table data concerning all buses has been received.

The Examiner cites page 1668, column 2, paragraph 3.1 of Tai as disclosing this step. Applicants disagree and submit that the cited portion does not disclose or suggest this step. The cited paragraph 3.1 does not concern the building of routing table, and furthermore, it does not describe any iterative process. It describes the computation of LAN id, which is done in one step, and indicates that this step is conducted periodically to account for changes in the network. In particular, this paragraph states that "by periodically exchanging the concatenated ids among brouters attached to the same LAN, the up to date LAN id is determined and the master brouter is elected." This passage means that a process of electing the minimum id as the LAN id is **conducted periodically** to adapt to changes in

the network, for example, for brouter failure. This passage does not disclose or suggest conducting an **iterative process** of building a routing table until the routing table data concerning all buses has been received. Therefore, applicants submit that Tai does not disclose or suggest the iteration feature as recited in step (e) of claim 1.

In summary, Tai teaches a system that builds delay tables, exchanges the delay tables and computes the routing tables from the delay tables. For the reasons discussed above, the steps of this process are entirely distinguishable from the steps for determining a routing table in a network comprising buses connected by bridges as recited in claim 1. Therefore, applicants respectfully submit that Tai fails to disclose or suggest every limitation of claim 1, and as such, request reconsideration and withdrawal of this rejection

CLAIM 14

Independent claim 14 recites:

> 14. Portal device adapted to be connected to a first communication bus and adapted to be linked to a companion portal device for connection to a second communication bus, said portal device comprising:
> - a bus interface for connection to said first communication bus;
> - a switching fabric interface for connection to said companion portal device;
> - a memory for storing routing table data;
> - means for transmitting routing table data stored in said memory to said companion portal, for broadcasting routing table data stored in said memory on said first communication bus, for controlling said bus interface and switching fabric interface to receive or transmit routing table data, and for concatenating received routing table data with data stored in said memory during successive receive and transmit cycles relating to routing table data for remote communication buses.

Independent claim 14 is directed to a portal linked to a companion portal and coupled to a bus, wherein the portal is adapted to determine the routing table in accordance with the method of claim 1. For the reasons discussed hereinabove with respect to independent claim 1, applicants submit that the system of Tai fails to disclose or suggest at least the limitation of "... means for transmitting routing table data stored in said memory to

said companion portal, for broadcasting routing table data stored in said memory on said first communication bus, for controlling said bus interface and switching fabric interface to receive or transmit routing table data, and for concatenating received routing table data with data stored in said memory during successive receive and transmit cycles relating to routing table data for remote communication buses."

As discussed above, Tai is directed to a system wherein a brouter builds delay tables, exchanges delay tables, and computes routing tables from the delay tables. Tai does not disclose or suggest means for transmitting routing tables to a companion portal or means for concatenating received routing table data with data stored in memory as recited in claim 14. For the reasons discussed hereinabove, the cited portions of Tai do not disclose or suggest these features. Therefore, applicants submit that Tai fails to disclose each and every limitation of claim 14, and as such, claim 14 is not anticipated by Tai, and respectfully request reconsideration and withdrawal of this rejection.

Rejection of Claims 5 and 6 under 35 USC 103(a) over Tai in view of Garcia (U.S. Published Application 20020049561).

The cited prior art fails, in any combination, to render pending claims 5 and 6 unpatentably obvious under 35 U.S.C. 103(a). To establish a prima facie case of obviousness, all of the recited claim limitations must be taught or suggested in the prior art. *See, M.P.E.P. 706.02(j); see also, M.P.E.P. 2143.03 citing In re Royka, 490 F.2d 981, 180 USPQ 580 (CCPA 1974) ("All words in a claim must be considered in judging the patentability of that claim against the prior art.") and In re Wilson, 424 F.2d 1382, 1385, 165 USPQ 494, 496 (CCPA 1970).*

As discussed below, the Tai and Garcia, both singly and in combination, fail to teach or suggest all of the limitations of Claims 5 and 6 – and hence fail to render claims 5 and 6 unpatentable as a matter of law.

CLAIMS 5 and 6

Claim 5 depends from claim 1 and further recites that the routing table transmitted or broadcast by the given portal contains the entire routing table. Claim 6 depends from claim 5 and further recites that the iteration steps (a)-(e) stops when the routing tables received from the companion portal and local portals only contain data that is redundant with the routing table stored in the given portal.

Garcia is cited as teaching that the routing table data transmitted or broadcast by a given portal contains the entire routing table. Even assuming arguendo that Garcia teaches such a feature, applicants submit that claims 5 and 6, which depend from claim 1, is patentably distinguishable over the combination of Tai and Garcia because Garcia fails to cure the defect of Tai as applied to claim 1. Applicants submit that Garcia does not teach or suggest the limitations of claim 1 discussed above. Therefore, even if Garcia teaches the alleged feature, the combination of Tai and Garcia still fail to teach or suggest the additional limitations recited in claim 1.

The examiner states in the advisory action that "[t]his problem solving methodology of Garcia is of a paramount importance for curing the deficiencies of Tai and not the type of network." Applicants submit that such an assertion fails to address the deficiencies of Tai with regard to claim 1. Clearly, in order for 35 USC 103(a) to be properly applied, the combination of Tai and Garcia must teach or suggest each and every limitation of claim 5, which includes the limitations of claim 1. The fact that Garcia discusses a particular methodology for curing the deficiencies of Tai does not overcome the deficiencies of Tai as applied to claim 1. Therefore, applicants submit that claims 5 and 6, which depend from claim 1, are patentably distinguishable over the combination of Tai and Garcia, and respectfully request reconsideration and withdrawal of this rejection.

Rejection of Claim 11 under 35 USC 103(a) over Tai in view of Oechsle (U.S. Pat. No. 5570466).

Claim 11 depends from claim 1 and further recites that a selected path to a given remote bus is a function of the bandwidth of portals on the selected path.

Oechsle is cited as teaching selecting the path to a given remote bus as a function of the bandwidth of portals on the path. However, even assuming arguendo that Oechsle teaches the above, the combination of Tai and Oechsle still fails to cure the deficiencies of Tai as applied to claim 1. As such, the combination of Tai and Oechsle fails to teach or suggest every limitation of claim 11, which depends from claim 1, and thus, claim 11 is patentably distinguishable over the combination of Tai and Oechsle, and respectfully request reconsideration and withdrawal of this rejection.

VIII CONCLUSION

In view of the above, applicants submit that the pending claims are not anticipated or rendered obvious in view of the cite references. Accordingly it is respectfully requested that the rejection of Claims 1-14 be reversed.

Respectfully submitted,
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APPENDIX I - APPEALED CLAIMS

1. Method for determining a routing table in a communication network comprising buses connected by bridges, each bridge comprising two companion portals, a first portal being connected to a first bus and a second portal being connected to a second bus, each bus being identified by a unique bus identifier, each portal being identified by a unique portal identifier, said method comprising the steps of:

(a) transmitting, by a given portal, routing table data stored by said given portal to a companion portal associated with said given portal and receiving, by said given portal, routing table data from the companion portal;

(b) concatenating said routing table data received in step (a) with the contents of the routing table data stored by said given portal;

(c) broadcasting said routing table data stored by said given portal on a local bus associated with the given portal;

(d) receiving routing table data broadcast by other portals on the local bus and concatenating said received routing table data broadcast by other portals with contents of the routing table data stored by said given portal;

(e) repeating the above steps until routing data concerning all buses in the network has been received by said given portal.

2. Method according to claim 1, wherein

- the routing table data transmitted by said given portal during the first iteration of the step (a) comprises an identifier of the given portal and an identifier of the given portal's local bus;

- the routing table data received by said given portal from the companion portal during the first iteration of step (a) comprises an identifier of said companion portal and an identifier of the companion portal's local bus.

3. Method according to claim 2, wherein said routing table data transmitted, respectively received, by said given portal comprises the given portal's identifier, respectively the identifier of the given-portal's companion portal.

4. Method according to claim 2, wherein the routing table of a portal comprises the identifiers of remote buses, and for each remote bus, the identifier of the portal local to

the remote bus having initially transmitted the remote bus identifier, the depth of the remote bus compared to the bus local to the given portal, and the identifier of the local portal having broadcast the routing table data comprising the remote bus identifier on the local bus.

5. Method according to claim 1, wherein the routing table data transmitted or broadcast by said given portal contains the entire routing table.

6. Method according to claim 5, wherein the given portal stops iterating the steps (a) to (e) when the routing tables received from the companion portal and local portals contain only data which is redundant with the given portal's own routing table.

7. Method according to claim 1, wherein the routing table data transmitted or broadcast by the given portal comprises only a part of the routing table which was not transmitted or broadcast by said given portal during a previous step.

8. Method according to claim 7, wherein the given portal stops iterating the steps (a) to (e) when the given portal did not receive routing data during a previous iteration.

9. Method according to claim 1, wherein the concatenation steps include selection of a unique path from the bus local to the given portal to any remote bus and deletion of non-selected paths from the routing table of the given portal.

10. Method according to claim 9, wherein said selected path to a given remote bus is a function of portal identifiers stored in the routing table for said given remote bus.

11. Method according to claim 9, wherein said selected path to a given remote bus is a function of the bandwidth of portals on said selected path.

12. Method according to claim 9, wherein said selection is made among the shortest paths to the remote bus, paths of greater length being deleted from the routing table.

13. Method according to claim 1, wherein a routing table is simplified for the purpose of routing messages to contain a list of remote bus identifiers and for each remote bus whether the given portal shall forward a message from the bus local to the given portal to its companion portal.

14. Portal device adapted to be connected to a first communication bus and adapted to be linked to a companion portal device for connection to a second communication bus, said portal device comprising:

- a bus interface for connection to said first communication bus;
- a switching fabric interface for connection to said companion portal device;
- a memory for storing routing table data;
- means for transmitting routing table data stored in said memory to said companion portal, for broadcasting routing table data stored in said memory on said first communication bus, for controlling said bus interface and switching fabric interface to receive or transmit routing table data, and for concatenating received routing table data with data stored in said memory during successive receive and transmit cycles relating to routing table data for remote communication buses.

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